US009636753B2

(12) **United States Patent**
Anson et al.

(10) **Patent No.: US 9,636,753 B2**
(45) **Date of Patent: May 2, 2017**

(54) **ALIGNMENT DEVICE FOR DRILLING OR REAMING AN OPENING IN A STRUCTURE**

(71) Applicant: **THE COMMONWEALTH OF AUSTRALIA**, Edinburgh (AU)

(72) Inventors: **Peter George Anson**, Mt Macedon (AU); **Ian Andrew Anderson**, Heatherton (AU)

(73) Assignee: **THE COMMONWEALTH OF AUSTRALIA**, Edinburgh (AU)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 9 days.

(21) Appl. No.: **14/378,590**

(22) PCT Filed: **Feb. 12, 2013**

(86) PCT No.: **PCT/AU2013/000116**

§ 371 (c)(1),
(2) Date: **Aug. 13, 2014**

(87) PCT Pub. No.: **WO2013/120128**

PCT Pub. Date: **Aug. 22, 2013**

(65) **Prior Publication Data**

US 2015/0056034 A1 Feb. 26, 2015

Related U.S. Application Data

(60) Provisional application No. 61/597,974, filed on Feb. 13, 2012.

(51) **Int. Cl.**
B23B 49/02 (2006.01)
B25H 1/00 (2006.01)

(52) **U.S. Cl.**
CPC ***B23B 49/026*** (2013.01); *B23B 2215/04* (2013.01); *B23B 2260/118* (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC . B23B 49/026; B23B 49/02; B23B 2260/118; B25H 1/0064; B25H 1/0071;
(Continued)

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,749,514 A * 3/1930 Scott B23C 3/05 408/110
1,770,721 A * 7/1930 Willis B23Q 1/5462 403/131

(Continued)

FOREIGN PATENT DOCUMENTS

CH 683677 A5 * 4/1994 ..... B25H 1/0064
DE 33 26 697 A1 2/1985

(Continued)

OTHER PUBLICATIONS

Machine translation, Swiss patent document, CH683677A5, "Template for drilling bore holes in stone and concrete walls—has vacuum chamber in base plate coupled to vacuum pump by inlet and has rubber seal which compresses when predetermined underpressure is attained", Kaumann A. et al., Apr. 1994.*

(Continued)

Primary Examiner — Daniel Howell
Assistant Examiner — Chwen-Wei Su
(74) *Attorney, Agent, or Firm* — Seed IP Law Group LLP

(57) **ABSTRACT**

Embodiments generally relate to an alignment device to assist in drilling or reaming an opening in a structure. The device comprises: a base element, the base element having at least one first fixation element to allow fixation of the device relative to the structure; a positioning element coupled to the base element, wherein a position of the positioning element relative to the base element is adjustable; an alignment element mounted to the positioning element and rotatable in at least two dimensions to allow
(Continued)